#### Tabanus variegatus Fabr.

Tabor (S. E.). September, 1905; Woglum.

#### Tabanus wiedemanni O. S.

Lagrange (E.). Early August, 1904; Sherman. Southern Pines (S. E. C.). Early July, 1904, and early June, 1904; Rev. A. H. Manee.

### SEASONAL RANGE OF COMMONER TABANIDAE AT RALEIGH, N. C.

The species are arranged in the order of their appearance in the year, beginning with the earliest-appearing forms and closing with those that appear latest in the season. Based on the observations of C. S. Brimley.

- C. brimleyi, April to May 18, one on June 18.
- C. niger, May 2 to June 13.
- C. callidus, May 2 to Sept. 13.
- T. carolinensis, May 2 to May 13.
- T. pumilis, May 7 to Aug. 17.
- C. ceter, May 7 to May 13.
- C. univittatus, May 7 to Sept. 9.
- C. carbonarius, May 15 to June 15.
- C. lugens, May 18 to Aug. 16.
- C. flavidus, May 20 to Oct. 18.
- T. lineola, May 25 to Sept. 18.
- C. obsoletus, May 26 to Oct. 1.
- C. vittatus, May 26 to Oct. 10.
- T. fulvulus, May 28 to July 10.

- T. cerastes, May 29 to June 20.
- T. stygius, May 30 to July 10.
- C. fallax, June 5 to June 18.
- C. cursim, June 7 to July 17.
- T. molestus, June 7 to July 20.
- T. melanocerus, June 7 to July 17.
- T. trimaculatus, June 17 to July 23.
- C. fulvistigma, June 11 to July 25.
- T. atratus, June 11 to Oct. 11.
- T. coffeatus, June 13 to July 23.
- T. americanus, June 19 to Aug. 18.
- T. fronto, July 4 to Sept. 17. C. sequax, July 9 to Sept. 9.
- T. longus, July 14 to Sept. 13.
- T. variegatus, Sept. 2 to Oct. 29.

# New North American Pachyrhina, with a Table for Determining the Species.

By R. W. Doane, Stanford University.

In working over the large series of Pachyrhina that have come to me from time to time I have found it desirable to revise Loew's table (Vehr. Zool-Bot. Ges. 1879, 513-516) to include the Mexican species and other species that have since been described. Believing that it may prove helpful to some, especially as Loew's table is not easily accessible to all, I give

my table here together with descriptions of four undescribed species, including two of our most common California forms.

I have not seen specimens of *P. affinis* Bell. or *P. excelsior* Berg, and cannot from the descriptions select any characters which would not apply equally well to some of my specimens of *P. incurva* Lw. so these three species are placed together in the table until further study shall show some characters by which they may be separated. *P. occipitalis* Lw. occurs in two places as in the original table, as I find that desirable on account of the occiput being more or less shining, sometimes almost opaque.

Ι.	Thorax wholly black
	Thorax not wholly black
2.	Abdomen altogether black altissima O. S.
	Abdomen reddish-yellow toward the base erythrophrys Will.
3.	Thoracic stripes black
	Thoracic stripes brownish or reddish, sometimes obsolete 18.
4.	Wings hyaline
	Wings with a yellowish or brownish tinge
5.	Anterior end of the lateral stripes curved $\left\{ \begin{array}{l} \text{incurva Lw.} \\ \text{affinis Bell.} \\ \text{excelsior Berg.} \end{array} \right.$
	Anterior end of the lateral thoracic stripes not curved 6.
6.	Pleura without spots; occiput without a black spot virescens Lw.
	Pleura with spots
7.	Pleura for the most part cinereous collaris Say.
	Pleura not cinereous
8.	Pleura yellow, with yolk-yellow spots ordinaria O. S.
	Pleura variegated with brownish fuscous or blackish spots 9.
9.	Head wholly black
	Head yellow, with a black spot on the occiput
10.	A small black spot between the antennæ; the black spot on the occi-
	put does not reach over the vertex pedunculata Lw.
	No spot between the antennæ; the black spot on the occiput reaches
	over the vertex
1.	Pleura variegated with several fusco-blackish spots, posterior margin
	of the eighth sternite of male only gently curvedvittula Lw.
	Pleura sulphur-yellow, with only one or two reddish-brown spots;
	posterior margin of the eighth sternite of male with a deep
	V-shaped incision
2.	Wings with a brownish or brownish-yellow tinge
	Wings with a yellowish tinge, at least along the anterior margin . 14.

13.	Anterior ends of the lateral stripes of the thorax curved out,	
	lineata Scor	
	Anterior end of lateral stripes not curved out lugens Lv	v.
14.	Antennæ for the most part black or fuscous	5.
	Antennæ yellowish, darker toward the tip consularis O. S	Š.
15.	Pleura and metanotum spotted	б.
	Pleura and metanotum without spots noblis Lv	v.
16.	An opaque spot on the lateral thoracic stripes nigrolutea Bel	1.
	No opaque spot on the lateral thoracic stripes	7.
17.	Rostrum shining black above, yellow below usta O. S	5.
	Rostrum yellow mexicana Macc	٦.
18.	Thoracic dorsum opaque	9.
	Thoracic dorsum shining	2.
19.	Stigma brown	٥.
	Stigma yellowish	ſ.
20.	Lateral margins of the lateral thoracic stripes with three velvety	y-
	black spots elegantula Wil	1,
	Lateral thoracic stripes without black spots unimaculata Lw	₹.
21.	Antennæ longer than usual macrocera Say	ŗ.
	Antennæ shorter than usual tenuis Lw	٧.
22.	A velvet black spot at the anterior end of the lateral thoracic stripe.	,
	punctum Lw	
	No velvet black spot at the anterior end of the lateral thoraci	C
	stripe	
23.	Joints of the flagellum, except the basal ones, blackish 24	
	Joints of the flagellum in two colors	).
24.	Occiput altogether shining	;.
	Occiput opaque, with a shining triangular spot in the middle.	
25.	Cross-veins clouded	7.
	Cross-veins not clouded	
26.	Front and occiput unicolorous sodalis Lw	7.
	Front and occiput with a black stripe occipitalis Lw	٠.
27.	Thoracic suture colored with black at both ends	
	Thoracic suture not colored black	).
28.	Posterior margin of the eighth sternite of the male with a rather deep	р
	rounded incision, the edges of which bear long yellow hairs.	
	occidentalis n. sp	
	Posterior margin of the eighth sternite of the male straight or nearly	
	so, yellow hairs much shorter and sparser ferruginea Fabr	
29	Stigma brownish-yellow occipitalis Lw	
	Stigma blackish-brown gracilicornis Lw	
30.	Joints of the flagellum black at the base	
	Joints of the flagellum yellow at the base	
	Occiput without distinctly defined shining trianglexanthostigma Lw	
	Occiput opaque, with a distinct shining triangle	
32.	Costal cell colorless, stigma dark brown abbreviata Lw	
	Costal cell colored, stigma yellowish-brown	

- 34. Anterior end of lateral thoracic stripes curved . . . wulpiana Berg. Anterior end of lateral thoracic stripes not curved . . . saturalis Lw.
- 36. Stigma yellowish-brown, apex of the wings not distinctly infuscated.

Stigma dark brown, apex of the wings distinctly infuscated.

polymera Lw.

#### Pachyrina californica n. sp.

Yellow; head wholly black, opaque; sides of rostrum somewhat vellow; palpi black; first three segments of antennae vellow, the third sometimes darker toward the tip, other segments black, rather swollen at the base, with short stiff verticles; in the female, the 4th and 5th segments of the antennae are more or less yellow; ground color of the thorax bright vellow, shining, stripes shining black, median stripe broad, not extending back of the suture, lateral stripes reaching to the scutellum, not curved anteriorly; thoracic suture black in the middle; dorso-pleural suture black; dorso-pleural membrane vellow; collare yellow with median and lateral black spots; pleura black anteriorly, yellow posteriorly; scutellum and metanotum yellow with a median black line; halteres vellow, knobs brown; coxae black; femora and tibia yellow, black at the tips; tarsi blackish; abdomen yellow with rather broad black lines dorsally, ventrally and laterally; segments 6, 7, and 8 sometimes almost wholly black; hypopygium reddish brown; posterior margin of the eighth sternite of the male produced into two small triangular processes which bear dense tufts of rather long reddish-yellow hair; posterior margin of the large ninth tergite blackish, with a deep semi-circular incision, posterior lateral margins with a small deep U-shaped incision; ovipositor reddish-black at the base, valves short, straight, blunt; wings hyaline with a faint whitish spot in the region of the stigma; veins, stigma, and more or less distinct spots just back of the stigma, over the origin of the praefurca and over the base of the basal cells brown; a faint hardly perceptible cloud in all the cells; petiole of the 2nd posterior cell as long as the anterior cross-vein. Length, male, 15 mm, wing 13 mm., female, 18 mm., wing 14 mm.

Hab.—Stanford University, Cal. Many males and females. A single poorly preserved specimen from Pullman, Wash., seems to belong with this species.

#### Pachyrhina snowii n. sp.

Yellow; head orange yellow, shining, somewhat lighter below; the

broad black shining band on the occiput and the vertex attenuated anteriorly: a small indistinct reddish-brown spot above each eye: rostrum vellow with a brown spot on each side close to the base; palpi brownish, lighter at the joints; first two segments of the antennae vellow, others wholly brownish-black, middle segments slightly excised below; thorax sulphur yellow; dorsal stripes black, shining, the median one slightly dilated anteriorly; collare orange-yellow in the middle, blackish or brownish on the sides; a small back dash in the dorsalpleural membrane just before the base of the wing; pleura sulphurvellow, variegated with one or two reddish-yellow spots; scutellum reddish-brown; metanotum vellow with a faint reddish-brown spot posteriorly: halteres brownish-vellow, darker toward the tip; coxae and base of femora light yellow; femora and tibia brownish-yellow, black at the tips: tarsi black; abdomen vellow with dorsal, lateral and ventral, interrupted black stripes; eighth and ninth tergites of male wholly black; eighth sternite black, the posterior angles and a narrow border of the deep V-shaped incision vellowish, posterior angles bearing a few yellow hairs of moderate length; appendages of the hypopygium yellow; eighth segment of female black, ovipositor reddishvellow, upper valves long, slender, very slightly decurved at the tip, lower valves not reaching to the tip of the upper valves; wings hyaline; costal and subcostal cells with a slight vellowish tinge; stigma brown; second posterior cell sessile. Length, male 13 mm., wing 13 mm., female, 14 mm., wing 13 mm.

Hab.—Wyoming. One male, one female.

Much like *P. vittula* Lw. but may be distinguished by the fewer lighter markings on the pleura and particularly by the deep V-shaped incision on the posterior margin of the eighth sternite of the male.

#### Pachyrhina occidentalis n. sp.

Yellow; head opaque, orange-yellow above, much lighter yellow behind the eyes and below; occiput with an arrow-shaped brownish spot; rostrum, palpi and first three segments of antennae orange-yellow, remaining segments of antennae dark brown; palpi darker toward the tip; thorax light yellow, dorsal stripes brownish-yellow or reddish-yellow, broad, shining, the lateral ones expanding somewhat anteriorly; the sides of the collare, the coxae and irregular spots on the pleura, brownish or reddish-yellow; thoracic suture marked with black at both ends and with a black spot in the middle; three black spots along the dorso-pleural membrane, the first just back of the collare, the second a short distance in front of the wing and the third at the base of the wing; scutellum and metanotum with a broad, reddish-yellow stripe; halteres yellowish at the base, darker toward the tip,

knobs brownish; femora and base of tibiæ brownish-yellow, tibiæ growing darker toward the tip; tarsi brown, terminal segments almost black; abdomen brownish-yellow, darker posteriorly, posterior and lateral margins of the segments but slightly darker; the eighth sternite of the male long, broad, conspicuous, the posterior margin with a rather deep rounded incision, the edges of which bear a conspicuous fringe of long yellow hair; posterior margin of the ninth tergite with a small V-shaped incision, the edges of which are black; ovipositor reddish-yellow, upper valves straight, tips rounded, lower valves not reaching the tips of the upper valves; wings hyaline; stigma brown, more or less distinct; second posterior cell sessile or with a very short petiole (in two of my specimens this cell is broadly sessile in one wing, and with a very short petiole in the other wing). Length, male, 11 mm., wing, 11 mm.; female, 15 mm., wing, 15 mm.

Hab.—Central and Southern California, Montana, Eastern and Western Washington, Nevada, Arizona. (type from Stanford University, Cal.) Many males and females.

This species is very like P. ferruginea of the eastern United States and doubtless is the one that has been recorded from California as ferruginea. The long, broad eighth sternite of the male with its deeply cleft, long-haired posterior margin at once separates it from ferruginea in which this sternite is only slightly curved or cleft along the posterior margin and is provided with much shorter sparser hairs. The specimens from Arizona and one of the Washington specimens have the anterior lateral margins of the median thoracic stripe bordered with brown and in some the anterior ends of the lateral stripes are also marked with brown. The brown spot on the occiput is sometimes quite indistinct, in other specimens it is well marked, sometimes drawn out into a narrow line anteriorly. In a few of the specimens the tip of the knob of the halteres is yellowish. The palpi are sometimes wholly yellow and the 4th, 5th, 6th segments of the antennae of the female are usually more or less vellow.

### Pachyrhina breviorcornis n. sp.

Yellow; head yellow, with a brownish tinge and a small triangular brown spot above, lighter behind the eyes; rostrum yellow, brown on the sides; palpi yellow; antennae with thirteen segments, first and second wholly yellow, third clougate, basal half yellow, distal half brown,

segments four to twelve brown with the basal one-fourth or less yellow, all gently excised below, with a dense soft pubescence and a whorl of moderately long hairs, only four or five hairs in each whorl, thirteenth segment short, conical, wholly brown; thorax yellow; dorsal stripes reddish-brown; pleura light yellow, a spot below the wing brownish yellow; scutellum yellow with a brownish tinge above; metanotum yellow; halteres brownish, lighter at the base, knobs darker; coxae brownish yellow; legs yellowish-brown, tarsi and tips of femora and tibiæ darker; abdomen brownish yellow, darker posteriorly, with dorsal, lateral and ventral rows of black spots, those on the dorsum less distinct posteriorly, hypopygium small; eighth sternite with a rather deep U-shaped incision; wings with a faint yellowish tinge, costal and subcostal cell yellowish, stigma darker yellow; second posterior cell sessile. Length, 14 mm., wing 13 mm.

Hab.—Battle Creek, Mich. One male.

Somewhat like *P. eucera* Lw. but antennae only thirteen segmented, last segment shorter and the middle segments not so deeply excised. The second posterior cell in *eucera* is subject to considerable variation, in some of the specimens before me this cell is broadly joined to the discal cell, in others it has a short petiole, in a few the petiole is as long as or longer than the anterior cross vein.

## Some Oxybeline Wasps from New Mexico.

By S. A. Rohwer and T. D. A. Cockerell.

Oxybelus fossor n. sp. Q Length 4½ mm. Head and thorax deeply and densely punctured, the punctures on the vertex sparser, mesothorax shining but very strongly punctured; face, cheeks and pleura with silvery pubescence; prothorax not strongly carinate; mesonotum without depression; scutellum and postscutellum with medial longitudinal carina; mandibles except tips, narrow margin of prothorax at sides, tegulae, squama and two spots in front and spine white; antennae (flagellum darker above), legs except coxae, four anterior trochanters, line on intermediate femora above and the anterior femora above rufous; abdomen clear red, shining, sparsely punctured (the punctures denser beyond the second segment), thinly clothed with white pubescence; a broad band on first abdominal segment squarely interrupted in the middle, a linear rudimentary band on second and third segments creamy white; the medial depression of first segment is indistinct. Wings milky hyaline, nervures pale ferruginous.